

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

THE APPLICATION OF:

MICHAEL ALLEN BRYNER

CASE NO.: TK3690 US NA

APPLICATION NO.: 10/664,708

CONFIRMATION NO.: 4383

GROUP ART UNIT:

EXAMINER: UNKNOWN

FILED: SEPTEMBER 17, 2003

FOR: EXTREMELY HIGH LIQUID BARRIER FABRICS

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

In compliance with 37 CFR 1.97 and 1.98, Applicants bring to the attention of the U.S. Patent and Trademark Office information listed on the enclosed PTO/SB/08. A copy of the information is also enclosed.

Should any fee be required in connection with the filing of this Information Disclosure Statement, please charge such fee to Deposit Account No. 04-1928 (E. I. du Pont de Nemours and Company).

Respectfully submitted,

THOMAS W. STEINBERG ATTORNEY FOR APPLICANT

Registration No.: 37,013 Telephone: (302) 892-0887 Facsimile: (302) 892-7343

Dated: 12/12/03

TWS:fgl **Enclosures** O TE JOBS UN

Certificate of Mailing under 37 CFR 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

> Commissioner of Patents P.O. Box 1450 Alexandria, VA 22313-1450

on Alicember 12, 2003

Signature Signature

FRANCES G. LESTARDO

Type or printed name of person signing Certificate

Each paper must have its own certificate of mailing, or this certificate must identify each submitted paper.

TK3690 US NA POST CARD INFORMATION DISCLOSURE STATEMENT INFORMATION DISCLOSURE STATEMENT FORM PTO/SB/08A INFORMATION DISCLOSURE STATEMENT FORM PTO/SB/08B (2) WO 03/080905 A1 WO 02/43951 A2 WO 02/20668 A2. A3 WO 01/26610 A1 WO 01/27365 A1 WO 00/22207 A2, A3 WO 99/18893 A1 CA 2,305,004 GB 2 104 087 A GB 1 527 592 KR 2002-0093179 KR 2002-0093178

Page 1 of 3

Note:

10/664,708

Certificate of Mailing under 37 CFR 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

> Commissioner of Patents P.O. Box 1450 Alexandria, VA 22313-1450

on <u>Alecember 12, 2003</u>.

Date

Frances

Signature

FRANCES G. LESTARDO

Type or printed name of person signing Certificate

Each paper must have its own certificate of mailing, or this certificate must identify each Note: submitted paper.

10/664,708

TK3690 US NA

PETER K. BAUMGARTEN, Electrostatic Spinning of Acrylic Microfibers, Journal of Colloid and Interface Science, May 1971, pp. 71-79, Vol. 36, No. 1

A. E. ZACHARIADES, R. S. PORTER, JAYESH DOSHI, GOKOL SRINIVASAN, AND DARRELL H. RENEKER, High Modulus Polymers, A Novel Electrospinning Process, Polymer News, 1995, pp. 206-207, Vol. 20, Overseas Publishers Association, Amsterdam B.V., Pubblished under license by Gordon and Breach Science Publishers SA

RAIMUND JAEGER, MICHEL M. BERGSHOEF, CRISTINA MARTIN I BATLLE, HOLGER SCHONHERR, G. JULIUS VANCSO, Electrospinning of Ultra-Thin Polymer Fibers, Macromol. Symp. 1998, pp. 141-150, Vol. 127, Huthig & Wepf Verlag. Zug

H. FONG, I. CHUN, D. H. RENEKER, Beaded nanofibers formed during eletrospinning, Polymer,, 1999, pp. 4585-4592, 40, Elsevier Science Ltd.

SHAHRZAD ZARKOOB, DARRELL H. RENEKER, R. K. EBY, STEVEN D. HUDSON, DALE ERTLEY, WADE W. ADAMS, Structure and Morphology of Nano Electrospun Silk Fibers, Polymer Preprints, 1998, pp. 244-245, Vol. 39, Issue 2

X. FANG and D. H. RENEKER, DNA Fibers by Electrospinning, J. Macromol. Sci.-Phys., 1997, pp. 169-173, B36(2), Marcel Dekker, Inc.

GOKUL SRINIVASAN and DARRELL H. RENEKERT, Structure and Morphology of Small Diameter Electrospun Aramid Fibers, Polymer International, 1995, pp. 195-201, 36, SCI, Great Britain

FANG, XIAOYAN, Application of electrospinning for polymers, Dissertation Abstracts International, February 1998, p. 4246-B, Vol. 58 No. 8

JAYESH DOSHI and DARRELL H. RENEKER, Electrospinning Process and Applications of Electrospun Fibers, Journal of Electrostatics, 1995, 151-160, 35, Elsevier Science B.V. DR. HEIDI SCHREUDER-GIBSON, US Army Universities Team Up to Develop Electrospun Nanofibers for Clothing Applications, International Fiber Journal, 1998, pp. 49-50, Vol. 13 PHILLIP GIBSON, DONALD RIVIN, CYRUS KENDRICK, and HEIDI SCHREUDER-GIBSON, Humidity-Dependent Air Permeability of Textile Materials, Textile Research Journal, 1999, pp. 311-317, 69(5)

Page 2 of 3

Certificat of Mailing under 37 CFR 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

> Commissioner of Patents P.O. Box 1450 Alexandria, VA 22313-1450

on <u>December 12, 2003</u>
Date

Signature

FRANCES G. LESTARDO

Type or printed name of person signing Certificate

Each paper must have its own certificate of mailing, or this certificate must identify each Note: submitted paper.

10/664.708

TK3690 US NA

W. JOHN G. MC CULLOCH, Ultrafine To Nanofine Fibers Via Spunmelt Processes, Nonwoven World, 2000, pp. 87-92, August-September

STANLEY E. ROSS, Electrospinning: The Quest for Nanofibers, Fiber Engeering, International Fiber Journal, October 2001, pp. 50-53

DR. HEIDI SCHREUDER-GIBSON (BILL SMITH), US Army develops fabric membrane to provide multipurpose protection, Technical Textiles International, May 1998, p. 6

PHILLIP GIBSON, HEIDI SCHREUDER-GIBSON and CHRISTOPHER PENTHENY,

Electrospinning Technology: Direct Application of Tailorable Ultrathin Membranes, Journal of Coated Fabrics, July1998, pp. 63-72, Vol. 28, Technomic Publishing Co., Inc.

JAYESH DOSHI, Advancing Techniques in Electrospinning Fibers, Section 12, Nanofiber based Nonwoven Composites, its Properties, and Applications, Forbes, July 23, 2001 Issue, Red Herring, July 17, 2001 Issue, Chemical & Engineering News, October 16, 2000 Issue

MICHEL M. BERGSHOEF and G. JULIUS VANCSO, Transparent Nanocomposites with Ultrathin, Electrospun Nylon-4,6 Fiber Reinforcement, Advanced Materials, 1999, pp. 1362-1365, 11, No. 16, Wiley-VCH Verlag GmbH, Weinheim

A. BUER, S. C. UGBOLUE, and S. B. WARNER, Electrospinning and Properties of Some Nanofibers, Textile Research Journal, 2001, pp. 323-328, 71(4)

Y. A. DZENIS and D. H. RENEKER, Polymer Hybrid Nano/Micro Composites, Proceedings of the American Society for Composites, Ninth Technical Conference, September 1994, pp. 657-665, Technomic Publishing Co. Inc. Lancaster-Basel

JONG-SANG KIM and DARRELL H. RENEKER, Polybenzimidazole Nanofiber Produced by Electrospinning, Polymer Engineering and Science, May 1999, pp. 849-854, Vol. 39, No. 5 DARRELL H. RENEKER and IKSOO CHUN, Nanometre diameter fibres of polymer, produced by electrospinning, Nanotechnology, 1996, pp. 216-223, 7, IOP Publishing Ltd., Printed in UK

Page 3 of 3

O IN 1 MM HE WAR

PTO/SB/08A (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 1 of 3

Complete if Known					
Application Number	10/664708				
Filing Date	September 17, 2003				
First Named Inventor	MICHAEL ALLEN BRYNER				
Group Art Unit	-				
Examiner Name					
Attorney Docket Number	TK3690USNA				

	U.S. PATENT DOCUMENTS					
Examiner Initials *	Cite No.1		ocument Number - Kind Code ² (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US -	2003/0129909 A1	07-10-2003	ZUCKER	
		US -	2003/0106294 A1	06-12-2003	CHUNG ET AL.	
		US -	2002/0117782 A1	08-29-2002	HAYNES ET AL.	
		US -	6,520,425 B1	02-18-2003	RENEKER	
		US -	6,315,806 B1	11-13-2001	TOROBIN ET AL.	
		US -	6,269,513 B1	08-07-2001	TOROBIN	
		US -	6,265,333 B1	07-24-2001	DZENIS ET AL.	
		US-	6,183,670 B1	02-06-2001	TOROBIN ET AL.	
		US -	6,110,590	08-29-2000	ZARKOOB ET AL.	
		US-	6,106,913	08-22-2000	SCARDINO ET AL.	
		US-	5,522,879	06-04-1996	SCOPELIANOS	
		US -	4,524,036	06-18-1985	GILDING ET AL.	
		US-	4,127,706	11-28-1978	MARTIN ET AL.	
		US -	4,069,026	01-17-1978	SIMM ET AL.	
-		US-	4,044,404	08-30-1977	MARTIN ET AL.	
	-	US-	4,011,067	03-08-1977	CAREY, JR.	
	_	US-				
		US-				
		US -				

	FOREIGN PATENT DOCUMENTS						
Examiner	Cite No.1	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant		
Initials*		CountryCode ³ Number ⁴ Kind Code ⁵ (if known)	MM-DD-YYYY		Figures Appear	Τ ₆	
		WO 03/080905 A1	10-02-2003	Nano Technics Co. Ltd.			
		WO 02/43951 A2	06-06-2002	Kimberly-Clark Worldwide Inc,	·		
		WO 02/20668 A2. A3	03-142002	Donaldson Co. Inc.			
		WO 01/26610 A1	04-19-2001	The University of Akron			
		WO 01/27365 A1	04-19-2001	The University of Akron			
		WO 00/22207 A2, A3	04-20-2000	The University of Akron			
		WO 99/18893 A1	04-22-1999	Drexel Univ./Allegheny Health Education and Research Foundation			
		CA 2,305,004	10-30-2000	Fibermark Gessner GMBH			
		GB 2 104 087 A	03-02-1983	The Univ. of Liverpool/Ethicon Inc.			
·		GB 1 527 592	10-04-1978	Imperial Chemical Industries Ltd.			
-		KR 2002-0093179	12-16-2002	Nano Techniques Co. Ltd.			
		KR 2002-0093178	12-16-2002	Nano Techniques Co. Ltd.			

Examiner Signature	Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto. or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ¹ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

OF 1 2003 LETE

PTO/SB/08B (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE
STATEMENT BY APPLICANT

(use as many sheets as necessary)

Complete if Known

Application Number 10/664708

Filing Date September 17, 2003

First Named Inventor MICHAEL ALLEN BRYNER

Group Art Unit

Examiner Name

Sheet	2	of 3 Attorney Docket Number TK3690USNA			
OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS					
Examiner Initials * No. Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume number(s), publisher, city and/or country where published.			T ²		
	PETER K. BAUMGARTEN, Electrostatic Spinning of Acrylic Microfibers, Journal of Colloid and Interface Science, May 1971, pp. 71-79, Vol. 36, No. 1				
		A. E. ZACHARIADES, R. S. PORTER, JAYESH DOSHI, GOKOL SRINIVASAN, AND DARRELL H. RENEKER, High Modulus Polymers, A Novel Electrospinning Process, Polymer News, 1995, pp. 206-207, Vol. 20, Overseas Publishers Association, Amsterdam B.V., Pubblished under license by Gordon and Breach Science Publishers SA			
		RAIMUND JAEGER, MICHEL M. BERGSHOEF, CRISTINA MARTIN i BATLLE, HOLGER SCHONHERR, G. JULIUS VANCSO, Electrospinning of Ultra-Thin Polymer Fibers, Macromol. Symp. 1998, pp. 141-150, Vol. 127, Huthig & Wepf Verlag. Zug			
		H. FONG, I. CHUN, D. H. RENEKER, Beaded nanofibers formed during eletrospinning, Polymer,, 1999, pp. 4585-4592, 40, Elsevier Science Ltd.			
	SHAHRZAD ZARKOOB, DARRELL H. RENEKER, R. K. EBY, STEVEN D. HUDSON, DALE ERTLEY, WADE W. ADAMS, Structure and Morphology of Nano Electrospun Silk Fibers, Polymer Preprints, 1998, pp. 244-245, Vol. 39, Issue 2				
	X. FANG and D. H. RENEKER, DNA Fibers by Electrospinning, J. Macromol. SciPhys., 1997, pp. 169-173, B36(2), Marcel Dekker, Inc. GOKUL SRINIVASAN and DARRELL H. RENEKERT, Structure and Morphology of Small Diameter Electrospun Aramid Fibers, Polymer International, 1995, pp. 195-201, 36, SCI, Great Britain				
FANG, XIAOYAN, Application of electrospinning for polymers, Dissertation Abstracts International, February 1998, p. 4246-B, Vol. 58 No. 8 JAYESH DOSHI and DARRELL H. RENEKER, Electrospinning Process and Applications of Electrospun Fibers, Journal of Electrostatics, 1995, 151-160, 35, Elsevier Science B.V.					
	DR. HEIDI SCHREUDER-GIBSON, US Army Universities Team Up to Develop Electrospun Nanofibers for Clothing Applications, International Fiber Journal, 1998, pp. 49-50, Vol. 13				
	PHILLIP GIBSON, DONALD RIVIN, CYRUS KENDRICK, and HEIDI SCHREUDER-GIBSON, Humidity- Dependent Air Permeability of Textile Materials, Textile Research Journal, 1999, pp. 311-317, 69(5)				
Examiner Signature		Date Considered			

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Substitute for form 1449A/PTO

PTO/SB/08B (08-03) Approved for use through 07/31/2006. OMB 0551-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

INFORMATION DISCLOSURE

Complete if Known Application Number 10/664708 Filing Date September 17, 2003 First Named Inventor MICHAEL ALLEN BRYNER Group Art Unit Examiner Name

STATEMENT BY APPLICANT (use as many sheets as necessary) Shoot 1 of 3 Attorney Docket Number | TK3690USNA

OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS					
	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.			
		W. JOHN G. MC CULLOCH, Ultrafine To Nanofine Fibers Via Spunmelt Processes, Nonwoven World, 2000, pp. 87-92, August-September			
		STANLEY E. ROSS, Electrospinning: The Quest for Nanofibers, Fiber Engeering, International Fiber Journal, October 2001, pp. 50-53			
		DR. HEIDI SCHREUDER-GIBSON (BILL SMITH), US Army develops fabric membrane to provide multipurpose protection, Technical Textiles International, May 1998, p. 6			
	t	PHILLIP GIBSON, HEIDI SCHREUDER-GIBSON and CHRISTOPHER PENTHENY, Electrospinning Technology: Direct Application of Tailorable Ultrathin Membranes, Journal of Coated Fabrics, July1998, pp. 63-72, Vol. 28, Technomic Publishing Co., Inc.			
	JAYESH DOSHI, Advancing Techniques in Electrospinning Fibers, Section 12, Nanofiber based Nonwover Composites, its Properties, and Applications, Forbes, July 23, 2001 Issue, Red Herring, July 17, 2001 Issue Chemical & Engineering News, October 16, 2000 Issue				
MICHEL M. BERGSHOEF and G. JULIUS VANCSO, Transparent Nanocomposites with Ultrathin, Electrospur Nylon-4,6 Fiber Reinforcement, Advanced Materials, 1999, pp. 1362-1365, 11, No. 16, Wiley-VCH Verlag Gmbl Weinheim					
	A. BUER, S. C. UGBOLUE, and S. B. WARNER, Electrospinning and Properties of Some Nanofibers, Textile Research Journal, 2001, pp. 323-328, 71(4)				
	Y. A. DZENIS and D. H. RENEKER, Polymer Hybrid Nano/Micro Composites, Proceedings of the American Society for Composites, Ninth Technical Conference, September 1994, pp. 657-665, Technomic Publishing Co. Inc. Lancaster-Basel JONG-SANG KIM and DARRELL H. RENEKER, Polybenzimidazole Nanofiber Produced by Electrospinning, Polymer Engineering and Science, May 1999, pp. 849-854, Vol. 39, No. 5				
	DARRELL H. RENEKER and IKSOO CHUN, Nanometre diameter fibres of polymer, produced by electrospinning, Nanotechnology, 1996, pp. 216-223, 7, IOP Publishing Ltd., Printed in UK				
Examiner	- [Date			

L			
_			
Examiner		Date	
Signature		Considered	1

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Applicant's unique citation designation number (optional). Applicant is to place a check mark here if English language Translation is attached.